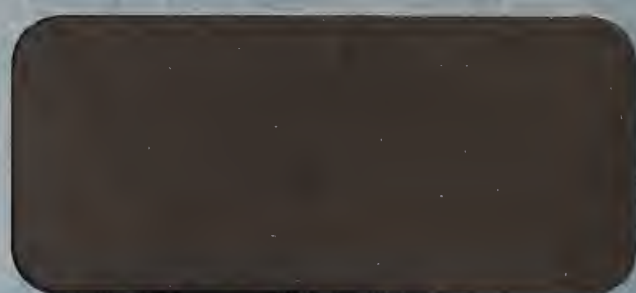


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DEVELOPMENT AND EVALUATION
OF TWO ALCOHOL EDUCATION
PROGRAMS FOR THE TORONTO
BOARD OF EDUCATION



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DEVELOPMENT AND EVALUATION
OF TWO ALCOHOL EDUCATION
PROGRAMS FOR THE TORONTO
BOARD OF EDUCATION

by

Michael S. Goodstadt
Margaret A. Sheppard
Susan H. Crawford



Substudy No. 941

1978

Addiction Research Foundation
33 Russell Street
Toronto, Ontario. M5S 2S1

ABSTRACT

Two sets of ten alcohol education lesson plans were developed for use with students in grades 7-8 and grades 9-10. Testing with teachers and students in sixteen elementary and secondary schools, involving both experimental and control classes, showed that the lessons (1) were well received by students and teachers; (2) increased levels of knowledge; (3) had mixed effects on attitudes; and (4) produced some positive changes in reported alcohol use and expectations concerning future use.



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ACKNOWLEDGEMENTS

We should like to express our appreciation to the many individuals who have assisted in the development and evaluation of these lesson plans. Included are former and present Trustees of the Toronto Board of Education who responded so positively to representations from Alan Anderson and Rosemaire Murphy concerning the problems arising from alcohol use among Toronto students. Encouragement and support for our work came from staff members of the Toronto Board of Education including, at the conception of the project, Mr. Michael Lennox, Superintendent of Curriculum, Mr. Donald Rutledge, Assistant Superintendent of Curriculum, Mr. Robert Gladish, Director of Physical and Health Education, Ron Batchelor, Assistant Director, and Gloria Torrance, and John Mitchelyuk, consultant staff of the Physical and Health Education Department.

Initial planning of the lessons was greatly assisted by the participation of teachers Terry Berkowski, John Tovell, Sharon Flinn and Bob Murray.

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To anyone whose contribution has been overlooked, we apologize and offer anonymous but sincere thanks. The same appreciation goes to the many students who made this undertaking both possible and worthwhile

Of the many who helped in seeing this project through to completion, special thanks must go to Mrs. Gloria Torrance of the Physical and Health Education Department. She has stayed with us throughout, encouraging us, providing invaluable input, obtaining the cooperation of schools and teachers, and finally, patiently bearing with us during the report-writing stage.

Finally, deficiencies in the lesson-plans and evaluation are attributable solely to ourselves. We hope they are not too serious and we offer these lessons as a positive step in education regarding alcohol in the lives of our young people.

October 1977

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1 INTRODUCTION

The Minutes for July 23, 1974 of the School Programs Committee of the Toronto Board of Education recorded that:

"Trustee Nelson moved that the Director of Education be requested to report on how a comprehensive guideline might be developed in the area of alcohol education and the possibilities for sources of funding for such a program;".

Since that date a series of steps have been taken leading to the development of new alcohol curriculum lesson plans for grades 7 and 8 and for 9 and 10. In outline these steps have included:

1. Exploratory meetings held between members of the staff of the ADDICTION RESEARCH FOUNDATION and members of the Physical and Health Education Department of the Toronto Board of Education, on December 6, 1974, and February 3, April 17, and May 9, 1975, to consider content, approaches, and implementation of an Alcohol Curriculum Guide for Grades 7, 8, 9 and 10.
2. In May 1975, four teachers from the senior and secondary schools volunteered to join in the discussions, and meetings of the newly-formed committee were held on May 22nd, June 5th, June 18th, July 8th, July 22nd, August 7th and August 21st, to discuss the issues and related content, methods, etc., based on Ministry of Education Guidelines.
3. On August 14, 1975, the Superintendent of Curriculum and Program received a copy of a draft proposal from the Addiction Research Foundation outlining the proposed program (see Appendix A)

4. Twelve topics were outlined and possible content and processes were developed. These units were submitted to the Toronto Board of Education by the staff of the Addiction Research Foundation.

5. The proposed program and related evaluation was discussed and approved by the School Programs Committee on October 1, 1975. (see Appendix B)

6. Draft lesson outlines were submitted to participating teachers for their preliminary evaluations in December 1975 and January 1976.

7. Lessons were further developed and tested in classrooms in the Spring of 1976; pre- and post-program measures were obtained from participating students.

8. A progress report was submitted to the June 18, 1976 meeting of the School Programs Committee. (see Appendix C).

9. Analysis of program impact was undertaken, and lessons were modified in line with these evaluations and classroom experience.

A full report of these steps and their outcomes now follows.

2. METHOD

2.1 Curriculum Lesson Plans

The Alcohol Curriculum Lesson Plans evaluated in the major part of this study consisted of a series of lesson outlines for use by teachers. Each lesson plan included a set of lesson objectives and suggested steps to be followed by the teacher in dealing with the lesson topic. All necessary factual knowledge, educational processes and activities, as well as expected outcomes of class participation, were included in the lesson plans (see Appendix D for a sample lesson outline). The lesson plans were, therefore, designed to permit the teaching of the selected topics with a minimum of preparation, and without the need for additional materials. Lessons were designed to stand as separate units which, nevertheless, formed an integrated whole; lessons could be taught independently, in sequence with all or some of the other lessons, or in amalgamation with other lessons. Although considerable detail regarding both educational content and process were included, it was expected that teachers would, in practice, select from among the suggested material; for the evaluation study, however, it was stressed that teachers should attempt to follow the plans as closely as possible.

The topics covered by both sets of curriculum lesson plans are shown in Table 1.

Although the lessons might most profitably be taught over an extended time frame (e.g. one lesson per week), nearly all teachers chose or were forced by their class schedules to teach them in a short concentrated period of time (e.g. everyday for a week).

Control classes received no material dealing with alcohol during the test period.

TABLE 1

Topics Covered By Alcohol Curriculum

Lesson Plans for Grades 7/8 and 9/10

Lesson Number	Lesson Topics	
	Grade 7/8	Grade 9/10
1	Alcohol and Myths	Alcohol and Myths
2	Advertising of Alcohol	Television/Media Portrayal of Alcohol Use
3	Why People Drink	Alcohol and People's Needs
4	Effects of Drinking	Alcohol and Youth
5	Some Positive Uses of Alcohol	Alcohol and the Law
6	Drinking and Driving	Alcohol and Driving I
7	Teenagers and Alcohol	Alcohol and Driving II
8	Alcohol and the Family	Alcohol and the Family
9	Alcohol and Sports	Alcohol and Fitness
10	Student Research and Consolidation	Alcohol and Sexuality

2.2 Preliminary Teachers' Evaluations

The Health and Physical Education Department of the Toronto School Board initially selected ten schools from the elementary school system and twelve from the secondary school system to assist in the study. Teachers from each school were either nominated or self-selected to participate.

Each participating teacher was asked to evaluate the lesson plans prior to teaching the lessons. Both individual lesson and general assessment instruments were developed for this purpose (see Appendices E1 and E2). Unfortunately, only five teachers of the twenty elementary school teachers and twenty from secondary teachers returned their assessment forms. Although feedback at this stage was very positive (ranging between 5.7 and 6.2 on 7-point rating scales), the response rate was too low to permit detailed statistical analysis.

All teachers were contacted personally regarding their reactions to the lessons; this more informal feedback indicated a generally positive response to the lesson plans.

2.3 Formal Classroom Evaluations

2.31 Sample Selection

As already indicated, sample selection for inclusion in the study was undertaken by the staff of the Toronto School Board Health and Physical Education Department. The final elementary and secondary school samples were the result of the following steps:

1. Selection of ten elementary schools and twelve secondary schools from the Toronto School Board system; these schools were chosen to include a wide range of both geographical locations and pupil characteristics. Details regarding students' characteristics are not available, although socio-economic and cultural differences would be at least as important as in other areas of education concerned with human behaviour.
2. Selection of teachers to participate from within the selected schools, was made by their school heads of health and physical education departments, or were self selected on the basis of interest and willingness. Little is known about the teachers' characteristics, although it is expected that this variable would be significant in teaching any program related to alcohol or other drugs.
3. All potentially participating teachers were provided with a complete set of the curriculum lessons.
4. Classes within a school were designated by the teachers either as "experimental" classes, to receive the new alcohol program, or to act as "control" classes.
5. Many of the teachers were unable, due to time and scheduling limitations, to teach the complete set of lessons. Selection of lessons was based primarily on teacher's preferences, although strong representations

were made to distribute the teaching of subsets of lessons according to pedagogical requirements. The recommended subsets were:

for grades 7/8: Lessons 1, 2, 3, 4 and 8;

for grades 9/10: Lessons 1, 4, 6, 8 and 10.

These subsets were considered to contain the minimum required content for the curricula. The range of lessons actually taught extended from three lessons to all ten lessons.

6. Finally, the sample included in the later analyses was limited to those students for whom both pre- and post-program measures were available.

Summaries of the characteristics of the samples are given in Tables 2a and 2b for Grades 7/8 and 9/10 respectively. From these it can be seen that considerable attrition of schools and students occurred due to many factors, including:

1. Withdrawal of participation by schools prior to the commencement of the study;
2. Failure to teach the lessons to the appropriate class (e.g. lessons taught to grade 11 instead of grades 9/10);
3. Failure to match pre- and post-program measures from one high school due to extreme turn-over of students;
4. Failure to give pre-and post-program measures to appropriate groups -- one high school reversed the pre- and post-measures;
5. Of the remaining 1603 students in the elementary school sample and the 828 in the secondary school sample, 1353 (84.4%) and 684 (82.6%) respectively possessed both pre- and post-program measures, and were included in the later analyses.

TABLE 2a

Summary of Characteristics for Grade 7/8 Sample

School	No. of ⁽¹⁾ Students	Grade		Sex		Group		Lessons Taught
		7	8	Male	Female	Experi- mental	Con- trol	
Earl Beatty	122 ⁽²⁾	0	122	58	64	97	25	1,2,3,4,8
Essex	162	77	85	0	162	136	26	1,2,3,4
Glen Ames	442	208	233	216	223	263	114	1,2,4,6,7,9
Glenview	57	0	57	57	0	57	0	1,3,4
Hodgson	244	82	161	123	121	166	78	1,2,3,4,8
Jesse Ketchum	113	53	56	3	110	84	28	a.1,3,7,6,8 b.2,4,5,8,9
Kent	100	45	55	57	43	73	27	1,2,3,4,8
Park	94	31	63	38	56	76	18	1,2,3
Total	1351	496	832	552	779	952	316	
%	100.0	37.2	62.4	41.5	58.5	75.1	24.9	

(1) Numbers in table refer to students who completed both pre- and post-program evaluations and were included in statistical analyses.

(2) Slight lack of correspondence between numbers due to occasional lack of relevant information (e.g. re: sex).

TABLE 2b

Summary of Characteristics for Grade 9/10 Sample

School	No. of ⁽¹⁾ Students	Grade		Sex		Group		Lessons Taught
		9	10	Male	Female	Experi- mental	Con- trol	
Bickford Park Secondary	30 ⁽²⁾	21	9	21	0	30	0	1 - 10
Bloor Collegiate	94	94	0	1	93	94	0	1,2,8
Central Tech.	37	29	8	37	0	17	20	1,2,4,
Eastern Comm.	66	66	0	31	34	66	0	1 - 10
Humberside Secondary	123	33	90	0	123	90	30	1 - 10
Lawrence Park High School	175	175	0	64	111	175	0	1,2
Malvern High School	87	0	87	38	49	62	25	1,4,5
Riverdale High School	70	70	0	0	70	48	22	1 - 10
Total	684	484	194	192	480	582	100	
%	100.0	71.4	28.6	28.6	71.4	85.3	14.7	

(1) Numbers in table refer to students who completed both pre- and post-program evaluations and were included in statistical analyses.

(2) Slight lack of correspondence between numbers due to occasional lack of relevant information (e.g. re: sex).

Other observations can be made regarding the sampling. There was generally poor experimental control over sampling procedures leading to several undesirable imbalances.

1. There was an underrepresentation of grade 10 students, due to alcohol education not being a standard component of the Toronto Board curriculum for this grade level.

2. Males in the secondary school sample were assigned to the control group, and in the secondary schools, control groups were unevenly spread across schools.

4. Finally, selection of lessons to teach did not follow the recommendations made by the researchers: few secondary teachers employed the recommended subset, and few elementary school teachers taught all lessons resulting in the distribution of students to lessons as shown in Table 3. Lesson 5 for the elementary schools was selected by very few teachers even though this lesson dealt with some of the positive uses of alcohol and had been specifically suggested by the teacher-advisors for inclusion in the curriculum.

TABLE 3

Number of Students Who Were Taught Lessons

Lesson No.	Elementary School		Secondary School	
	Number	% of Experimental Group	Number	% of Experimental Group
1	907	67	582	100
2	853	63	520	89
3	644	48	237	41
4	834	62	313	54
5	42	3	256	44
6	302	22	237	41
7	302	22	237	41
8	420	31	331	57
9	305	23	237	41
10	a	a	237	41

a This was a lesson in which students could present their individual research.

2.32 Pre- and Post-Program Evaluation Instruments

All students in the experimental and control groups were administered confidential pre- and post-program evaluation instruments. Students' responses from the two occasions were matched by means of a unique student code which was assigned prior to pre-testing. Questionnaires initially included both students' names and code numbers; before returning the questionnaires students removed their names (on a detachable label) from the questionnaire. Post-test questionnaires were administered in the same way, with the same combination of students' names and code numbers. All responses were, therefore, confidential - a point stressed to the students at the time of test distribution.

Administration of evaluation materials was conducted by Addiction Research Foundation staff in seven of the sixteen schools; the remaining nine schools preferred to administer the test materials themselves. Except in the case of two elementary schools, pre-testing occurred approximately one week prior to the commencement of the program. Post-test administration was given in the health lesson period following completion of the program; this period occurred between one day and one week after completion of the program: in the majority of the schools post-tests were completed after an interval of one week - in seven of the eight elementary schools and five of the eight secondary schools.

The evaluation instruments fell into four categories:

1. Alcohol Knowledge and Opinion Items: The majority of knowledge items assessed information directly related to the content of the lessons. A few items were expressions of opinions, and, being relatively few in number, were not included in the analyses. Separate instruments were developed for

evaluating the informational impact of the elementary and the secondary curricula. The post-test instruments included all pre-program items plus a larger number of new items.

The elementary schools' pre-test consisted of 49 items; these together with a further 52 dissimilar items constituted the 101 item post-test. The secondary schools' pre-test possessed 25 items, which together with an additional 35 items made up a 60 item post-test. Appendices F1 and F2 contain the knowledge items employed in the evaluation of the elementary and secondary schools' programs. Table 4 summarizes the Kuder-Richardson-20 reliability coefficients for the knowledge pre-tests and post-tests. This index measures the degree of consistency between test items; values can range from zero to 1.0, with 0.80 being considered an acceptable level for measures of the present kind (see Nunnally, 1967). The complete post-test knowledge instrument possessed an acceptable level of reliability.

Knowledge scores for both pre- and post-tests were computed for each student on the basis of the percentage of questions answered correctly. Missing or "don't know" responses were considered to be incorrect.

Impact of the programs on knowledge levels was measured by examining differences between experimental and control groups on (a) total post-program knowledge scores, (b) performance on those items identical on both testing occasions and (c) performance on those items which were asked only on the post-test. All comparisons between experimental and control groups took account of any pre-test differences between groups through the use of covariance statistical techniques.

2. Alcohol Attitude Scales: Two 12-item parallel-form attitude scales were constructed to measure attitudes towards alcohol, alcohol use and drug use in general (3 items). One of these scales was employed as a pre-test

TABLE 4

K-R 20 Reliability Coefficients For Knowledge Tests

	Elementary Schools' Test		Secondary Schools' Test	
	K-R 20	No. of Items	K-R 20	No. of Items
Pre-test	0.68	49	0.58	25
Post-test (all items)	0.89	101	0.81	60
Post-test (same items as pre-test)	0.81	49	0.65	25
Post-test (items not included in pre-test)	0.78	52	0.72	35
Number of Students		1353		684

while the other served as a post-test. Identical instruments were administered to elementary and secondary school students. The K-R-20 coefficients for pre- and post-tests were respectively 0.71 and 0.80 for the public school sample, and 0.76 and 0.80 for the high school sample. These coefficients indicate an acceptable level of attitude scale reliability (see Appendices G1 and G2 for copies of the attitude scales).

Pre-test and post-test attitude scores were computed for each student by reversing negatively phrased items, assigning the values 1-5 to responses from "Strongly Disagree" to "Strongly Agree", and summing the student's ratings for the 12 items. A positive score, therefore, indicates an attitude favourable to alcohol and its use.

Attitudinal impact was assessed by comparing experimental and control groups' post-test attitude scores, controlling for any pre-test differences in attitude by means of covariance procedures.

3. Alcohol Use Measures: The pre-test questionnaire enquired about students' previous week's quantity of consumption of beer, liquor and wine, information regarding their "usual" consumption, frequency of consumption and expectations regarding use in the succeeding twelve months. The post-program measures obtained similar information concerning volume of consumption and anticipated patterns of use in the succeeding twelve months.

The reliability and validity of self-reported drug use measures presents almost insurmountable problems for researchers. It is known, however, that such measures usually err on the side of under-reporting rather than over-reporting (see Smart 1975) and that estimates of frequency of alcohol use are

more reliable than estimates of quantity of alcohol use, especially as consumption increases. The measures of alcohol use employed in the present study should, therefore, be taken as relative rather than definitive, providing the basis for comparison between experimental and control groups.

Program impact was evaluated on the basis of:

(a) Changes in reported expectations concerning future alcohol use.

Students were asked on both pre- and post-tests to answer the following question:

In the next twelve months I expect to use alcohol
(beer, liquor, wine):

- a. A lot more often than during the past twelve months
- b. A little more often than during the past twelve months
- c. A little less often than during the past twelve months
- d. A lot less often than during the past twelve months
- e. About the same amount as during the past twelve months
- f. I do not use alcohol and do not expect to use it during the next twelve months.

The responses were recoded to form a scale ranging from anticipated greater use of alcohol (items a. and b. assigned a value of 1 and 2 respectively), through "no expected change" (items e. and f. with an assigned value of 3) to a reduction in alcohol use (c. and d. assigned values 4 and 5 respectively). Lower scores, therefore, indicate an expectation that more alcohol would be consumed in the future, while higher scores had the opposite significance. Comparisons were made between experimental and control groups' post-test responses controlling (by covariance analysis) for pre-test differences in answers to the same question.

(b) Changes in total reported alcohol consumption. At both the pre- and post-tests students were asked about the quantity of alcohol consumed in the previous week. These questions required specification of the number of bottles,

mugs, glasses etc. of beer, liquor and wine drunk. Conversions were made to render responses comparable in terms of fluid ounces of the beverage consumed, and total number of ounces of absolute alcohol consumed in the week prior to testing.

Program impact was evaluated by comparing experimental and control groups in terms of:

- (i) post-program quantity of beer, liquor, wine and total alcohol consumption controlling for pre-test differences in consumption;
- (ii) changes from alcohol use in the week prior to the pre-test to alcohol non-use in the week prior to post-test;
- (iii) changes from alcohol non-use in the week prior to the pre-test to alcohol use in the week preceding the post-test.

The pre-test and post-test measures of alcohol use are contained in Appendices H1 and H2.

4. Students' Evaluations of Lessons and Program: As an aid to the development of the lesson outlines, students in the experimental group provided lesson evaluations. To reduce the burden on both students and teachers, only a sample of students were required to complete evaluations for each lesson; each student was expected to complete an average of two lesson evaluations. Due to a fewer number of students being exposed to some of the lessons (see Table 3), some lessons were evaluated by very few students.

The lesson evaluation instrument, administered on completion of the lesson, (see Appendix I1) consisted of: (1) five 7-point scales to assess the lesson itself; (2) three 7-point scales to assess the perceived impact of the lesson; and (3) open-ended questions providing an opportunity for students to

express their opinions regarding the most helpful and least helpful aspects of the lesson.

At the end of the program students were requested to evaluate the course as a whole (see Appendix I2).

Analysis of lesson and course evaluations consisted of calculation of average numerical responses and tabulation of responses to open-ended questions. Since no student identification was attached to the evaluation instruments, no breakdown of results by demographic background or alcohol use was possible.

2.33 Hypotheses

It was hypothesized that:

I Students in the experimental groups would be more likely than control groups to possess more knowledge about alcohol after exposure to the program;

II Students in the experimental groups would be more likely than control groups to exhibit attitudes less favourable to the use of alcohol after exposure to the program;

III Students in the experimental groups would be less likely than control groups to use alcohol in inappropriate ways after exposure to the program

Derived Hypothesis IIIa: Students in the experimental groups would be more likely than control groups to show a reduction in their reported alcohol consumption after exposure to the program;

Derived Hypothesis IIIb: Students in the experimental groups would be more likely than control groups to expect to use alcohol less in the succeeding twelve months after exposure to the program.

These hypotheses would be tested by comparing experimental and control groups on appropriate post-program measures of knowledge, attitudes and alcohol use, controlling for pre-program differences.

Several observations are required regarding the derivation of the hypotheses and their expected fulfillment.

1. The hypotheses have been stated without reference to time-frames. It is implied, however, that some impact should be apparent in the immediate post-program period; for this reason all post-test measures were obtained immediately on conclusion of the program. It was, however, appreciated that

(a) some program effects which might be immediately evident tend to dissipate rapidly, and (b) some forms of impact (e.g. behavioural) are difficult to achieve after the short time period covered by the program. Reasons for concentrating on the immediate impact were, firstly, that a program should show the beginnings of an effect immediately and, secondly, the present research project was principally concerned with the development and evaluation of curricula; assessment of the long term effect of a final curriculum would more logically and practically follow completion of the formative research associated with the program's development.

2. Few previous evaluations have specified the research hypotheses or expected outcomes associated with the evaluation of a drug education program. It was the assumption of the present program that it should at least be able to increase students' levels of knowledge regarding alcohol. Precision regarding other outcomes was more problematical since the most important long-term objectives are probably best expressed in behavioural terms, that is, with respect to changes in alcohol use patterns.

3. Desirable alcohol use patterns are debatable. A few persons consider abstinence to be the goal; others believe a reduction in consumption to be the desired outcome. Others believe that objectives should not be stated in terms of quantity of alcohol consumed but with regard to the way in which alcohol is used, the reasons for its use, the situations in which it is used and the consequences, to the drinker and others, from its use. The position taken by the present researchers is that there is a considerable evidence (e.g. Brun et al 1975) to suggest that a reduction in alcohol consumption would have significant benefits to society as a whole. Defining the objectives of the present program in terms of a reduction in alcohol consumption is further

supported by recent evidence (e.g. Smart and Goodstadt, 1977) demonstrating an increase in alcohol consumption among young people in Ontario, and the commencement of alcohol use at an earlier age than was found previously. It was assumed that a reduction of alcohol consumption in these formative years would be associated with a reduction in the abuse or inappropriate use of alcohol at later stages of development. It should be noted, however, that although the present programs attempted to deal with individual and social factors associated with alcohol use, the evaluation of the programs did not include instruments designed to measure the programs' impact in relation to these factors.

4. Whereas longterm objectives are usually most satisfactorily stated in behavioural terms, mid-range objectives are often stated in terms of attitudes or behavioural intentions. One needs to be especially cautious, however, in placing too much emphasis upon the power of attitude change. A great deal of evidence has failed to show strong relationships between attitude-change and behaviour-change, except where well designed instruments have been employed, and when both the attitude and behaviour refer to well defined and closely related objects (see Goodstadt 1976). It has, however, been found that behavioural intentions relate to later behaviour more adequately than do attitudes. It is with these cautions in mind, therefore, that we have employed measures of attitude and behavioural expectations - they may play an important role in achieving long-term objectives, and may serve to guide in the development and evaluation of programs, but they are no substitute for long-term behavioural evaluations.

5. Hypothesized results predicted an overall decrease in pro-alcohol

attitudes and a decrease in expected and actual use of alcohol. The programs were, however, not designed to tell students to abstain from alcohol use or to change their attitudes away from alcohol use; they were composed to assist students in understanding their own and other people's use of alcohol and help in decision-making concerning alcohol use. It was expected, therefore, that though not necessarily the most desirable outcome, some students would, as a result of the program, be more in favour of alcohol use and expect to use it more in the future, without assuming that this would be equivalent to alcohol misuse or abuse.

6. The hypotheses have been stated in terms of the likelihood of achieving an outcome. An hypothesis tested in research is, however, stated as a "null hypothesis". In this form, it is hypothesized that no significant difference exists between the experimental and control conditions; rejection of the null hypothesis would, then, indicate that a significant difference does exist. Moreover, the alternative hypotheses in the present research have been stated in a single direction, such that the experimental group was expected to be more likely to show more knowledge, a less pro-alcohol attitude etc. than the control group. Failure to reject the null hypothesis would demonstrate that the program had not achieved its objective, but would not necessarily show that it was a "bad" program. If, however the outcomes were in the directions opposite to those hypothesized (e.g. the experimental group became more pro-alcohol in their attitudes), the value of the program could be strongly challenged.

7. It was anticipated that the major hypotheses would be supported to a greater or lesser degree depending on the characteristics of the participants. For this reason, although no specific sub-hypotheses were stated for sub-groups

employed in the study (e.g. males vs females, alcohol users vs non-users etc.), analyses and hypotheses testing were conducted on these sub-groups separately.

The program and its constituent lessons were evaluated not only in terms of outcome measures but also with regard to (a) the teachability of the lessons from the teachers' and students' points of view, and (b) the acceptance by the students of the content, format and processes incorporated into the program. No hypotheses involving experimental and control groups were involved in this part of the evaluation. Positive expectations were stated for those exposed to the lessons.

3. RESULTS

3.1 Pre-test Measures

Tables 5a and 5b summarize pre-test means for all major instruments for both the elementary and secondary school samples. These results are presented separately for experimental and control groups and for subgroups based upon typical alcohol use, grade and sex. "Drinkers" and "abstainers" were defined on the basis of responses to a pre-test question concerning average frequency of alcohol consumption: "abstainers" were those who indicated that on average they did not drink at all; "drinkers" were all remaining students, who drank on occasions, more or less frequently.

Tests of significance of differences were made between subgroup means (e.g. experimental males, control males, experimental females, control females) for each measure. Tukey's Honestly Significant Difference procedures (Winer 1971) were employed for this purpose. This technique controls for the probability of finding significant results when multiple statistical tests are performed. The results of these comparisons are summarized in Tables 5a and 5b by the use of suffixes: subgroup means possessing different suffixes are significantly different at least at the 5% level. Few significant differences between experimental and control groups existed on any of the pre-test measures, however, "drinkers" and "abstainers" differed significantly on nearly all measures.

TABLE 5a

Elementary School StudentsSummary of Pre-test Scores and Comparisons ⁽¹⁾ for Experimental and Control Groups and Various Subgroups ⁽²⁾

	All Students		Alcohol Use				Grade				Sex			
	Experimental	Control	Exp.	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.	Cont.
			Drinkers	Abstainers	Drinkers	Abstainers	7 or 9	8 or 10	7 or 9	8 or 10	Male	Female	Male	Female
Knowledge (% correct)	51.7	52.1	a 52.8	b 50.6	ab 52.5	ab 51.8	a 50.2	b 52.4	b 53.0	ab 51.4	ab 52.3	b 50.6	a 54.4	b 50.6
Attitudes	2.37	2.33	a 2.54	b 2.21	a 2.56	b 2.16	2.33	2.38	2.28	2.38	2.39	2.37	2.29	2.36
<u>Alcohol Consumption:</u>														
Beer (oz.)	4.19	3.33	a 8.28	b 0.43	a 8.13	b 0.00	3.10	4.50	1.20	5.54	5.63	2.83	4.11	2.84
Liquor (oz.)	0.31	0.32	a 0.65	b 0.00	a 0.79	b 0.00	0.26	0.33	0.30	0.34	0.28	0.31	0.32	0.32
Wine (oz.)	1.41	0.92	a 2.90	b 0.13	a 2.08	b 0.09	1.42	1.40	0.80	1.07	a 1.99	b 1.05	ab 1.29	b 0.69
Total (oz. abs. alc.)	0.54	0.43	a 1.05	b 0.04	a 0.98	b 0.01	0.47	0.56	0.30	0.57	0.68	0.42	0.52	0.37
Expected Alcohol Use In Next 12 Months	4.67	4.66	a 3.55	b 5.73	a 3.40	b 5.57	3.16	3.10	3.13	2.99	3.12	3.11	3.07	3.05

(1) Comparisons employed Tukey's Honestly Significant Difference Procedures (Winer 1971)

(2) For any set of subgroups (for each measure) means with different suffixes are significantly different at the 5% level.

TABLE 5b

Secondary School StudentsSummary of Pre-test Scores and Comparisons ⁽¹⁾ for Experimental and Control Groups and Various Subgroups ⁽²⁾

	All Students		Alcohol Use				Grade				Sex			
	Experimental	Control	Exp.		Cont.		Exp.		Cont.		Exp.		Cont.	
			Drinkers	Abstainers	Drinkers	Abstainers	7 or 9	8 or 10	7 or 9	8 or 10	Male	Female	Male	Female
Knowledge (% correct)	53.8	56.2	55.1	51.9	55.7	56.5	53.4	54.9	57.4	53.0	54.6	53.5	58.8	55.3
Attitudes	2.38	2.38	^a 2.56	^b 2.13	^a 2.57	^b 2.06	2.35	2.46	2.37	2.44	2.44	2.36	2.37	2.39
<u>Alcohol Consumption:</u>														
Beer (oz.)	8.84	4.81	^a 15.02	^b 0.05	^{ab} 7.53	^b 0.00	6.59	14.06	4.66	5.22	14.96	5.48	3.36	5.32
Liquor (oz.)	0.80	0.66	^a 1.37	^b 0.03	^{ab} 1.05	^b 0.00	^a 0.50	^b 1.50	^{ab} 0.70	^{ab} 0.56	0.84	0.77	0.17	0.84
Wine (oz.)	2.33	1.81	^a 3.84	^b 0.21	^{ab} 2.88	^b 0.11	1.99	3.14	1.80	1.83	1.51	2.55	0.96	2.12
Total (oz. abs. alc.)	1.11	0.77	^a 1.84	^b 0.05	^{ab} 1.21	^b 0.02	0.82	1.78	0.78	0.74	1.29	0.96	0.38	0.91
Expected Alcohol Use In Next 12 Months	4.24	4.01	^a 3.25	^b 5.69	^a 3.13	^b 5.62	3.09	3.09	3.12	3.07	3.07	3.09	3.12	3.10

(1) Comparisons employed Tukey's Honestly Significant Difference Procedures (Winer 1971)

(2) For any set of subgroups (for each measure) means with different suffixes are significantly different at the 5% level.

3.2 Changes in Levels of Knowledge

As already indicated, students received both a pre-test and a post-test designed to assess changes in levels of knowledge resulting from exposure to the program.

The mean percent correct responses on the pre-tests were 51.5% and 54.2% respectively for the elementary and secondary schools samples.

3.21 Elementary School Results

Table 6a summarizes the results of analyses of covariance for the elementary school sample. Hypothesis I was supported: students exposed to the experimental program showed significantly higher levels of knowledge after the program, compared to the control classes. The mean overall knowledge score for the experimental group was 53% compared to 48% for the control groups (both groups' scores were corrected for pre-test differences); this difference was significant beyond the 0.1% level of significance, ($F = 63.51$, $df = 1,1277$). This effect was consistent across subgroups, irrespective of whether program recipients were usually abstainers or drinkers, whether they were in grade 7 or 8, or whether they were males or females. Female experimental students, however, outperformed their corresponding males on the post-test ($p < .001$). A summary of these findings is presented in Table 6b.

3.22 Secondary School Results

A set of analyses parallel to those already reported for the elementary school sample are summarized in Tables 7a and 7b. From Table 7a

TABLE 6a

Elementary School Students

1. Post-test Mean Percentage Knowledge Scores Adjusted For
Pre-test Differences Between Experimental and Control Groups
2. Summary of Analyses of Covariance

	Total Knowledge Post-test	Items Same As Pre-test	Items Different From Pre-test
Experimental Group: Mean % Correct	53.0	59.7	45.3
Control Group: Mean % Correct	47.7	53.9	40.8
F ratio	63.51	66.95	43.37
Significance	$p < .001$	$p < .001$	$p < .001$
Number of Students	1276	1276	1276
Number of Items	101	49	52

it can be seen that, overall, Hypothesis I was again supported: students exposed to the experimental program significantly outperformed the non-exposed control group (60% vs 56% : $F = 11.63$, $df = 1,683$; $p < .001$). For males, however, this hypothesis was not supported (see Table 7b), since no significant differences between experimental and control groups were apparent. It was, again, found that female experimental students surpassed the performance of their male counterparts on the post-test ($p < .001$).

Examination of Table 2b suggests that the poor performance of the secondary school male experimental group might have been due to their exposure to relatively few of the lessons. For this reason a new knowledge score was composed of items relating only to the lessons to which students had been exposed. Examining program impact by means of this modified criteria demonstrated that the male experimental group significantly out-performed their control group (see Table 8b). Further comparisons showed no significant differences between males and females on this measure. (Table 8a shows the corresponding figures for the elementary school sample.)

3.23 Summary

The results supported the conclusion that the experimental programs at both school levels were successful in raising the level of knowledge among those exposed to the programs.

TABLE 6b

Elementary School Students

1. Total Knowledge Post-test Adjusted Mean Percentage Scores
2. Summary of Analyses of Covariance for Various Sample Subgroups

	Alcohol Use		Grade		Sex									
	Drinkers	Abstainers	7	8	Male					Female				
					All	Drinkers	Abstainers	G7	G8	All	Drinkers	Abstainers	G7	G8
Experimental Group: Mean % Correct	54.7	52.5	52.4	53.7	53.2	53.8	54.0	54.1	54.2	52.6	55.5	51.5	51.5	53.3
Control Group: Mean % Correct	49.9	46.9	46.9	48.4	48.6	50.0	48.2	50.7	48.0	47.3	50.0	46.1	45.4	48.9
F ratio	18.89	46.54	36.03	42.95	17.37	3.49	18.95	4.04	26.05	48.55	24.31	27.02	32.45	16.98
Significance	<.001	<.001	<.001	<.001	<.001	(.06)	<.001	<.05	<.001	<.001	<.001	<.001	<.001	<.001
Number of Students	537	657	432	832	533	246	250	135	389	741	290	407	297	442
Number of Items	101	101	101	101	101	101	101	101	101	101	101	101	101	101

TABLE 7a

Secondary School Students

1. Post-test Mean Percentage Knowledge Scores Adjusted For
Pre-test Differences Between Experimental and Control Groups
2. Summary of Analyses of Covariance

	Total Knowledge Post-test	Items Same As Pre-test	Items Different From Pre-test
Experimental Group: Mean % Correct	60.3	64.1	57.6
Control Group: Mean % Correct	56.3	59.0	54.3
F ratio	11.63	14.74	5.69
Significance	$p < .001$	$p < .001$	$p < .02$
Number of Students	684	684	684
Number of Items	60	25	35

TABLE 7b

Secondary School Students

1. Total Knowledge Post-test Adjusted Mean Percentage Scores
2. Summary of Analyses of Covariance for Various Sample Subgroups

	Alcohol Use		Grade		Sex									
	Drinkers	Abstainers	9	10	Male					Female				
					All	Drinkers	Abstainers	G9	G10	All	Drinkers	Abstainers	G9	G10
Experimental Group: Mean & Correct	62.5	58.2	59.1	63.3	58.5	60.6	58.1	57.9	60.2	61.4	63.6	58.5	59.8	65.0
Control Group: Mean & Correct	58.0	53.9	55.5	58.5	56.7	57.8	56.7	53.3	67.8	56.1	58.0	53.3	56.2	56.1
F ratio	8.33	5.33	7.29	3.90	0.45	0.58	0.14	2.25	2.58	16.41	11.44	5.84	6.34	10.85
Significance	<.01	<.02	<.01	<.05	NS	NS	NS	NS	NS	<.001	<.001	<.02	<.01	<.001
Number of Students	389	273	486	198	192	110	70	146	46	482	274	199	339	143
Number of Items	60	60	60	60	60	60	60	60	60	60	60	60	60	60

TABLE 8a

Elementary School Students

1. Total Knowledge Post-test Adjusted Mean Percentage Scores
Corrected for Lesson Exposure
2. Summary of Analyses of Covariance

	All Students	Males	Females
Experimental Group: Mean % Correct	51.0	51.1	50.9
Control Group Mean % Correct	45.2	45.7	44.8
F ratio	71.73	19.86	56.26
Significance	$p < .001$	$p < .001$	$p < .001$
Number of Students	1276	533	741

TABLE 8b

Secondary School Students

1. Total Knowledge Post-test Adjusted Mean Percentage Scores
Corrected for Lesson Exposure
2. Summary of Analyses of Covariance

	All Students	Males	Females
Experimental Group: Mean % Correct	64.8	65.6	64.8
Control Group: Mean % Correct	53.9	50.9	54.0
F ratio	41.48	16.25	27.50
Significance	$p < .001$	$p < .001$	$p < .001$
Number of Students	684	192	482

3.3 Changes in Attitudes Towards Alcohol

Students received two 12-item parallel-form attitude scales on the occasion of their pre-test and post-test respectively. It will be recalled that the range of scores for both pre-test and post-test was 0-5, with higher scores indicating an attitude more favourable towards alcohol use.

3.31 Elementary School Results

Table 9a summarizes the results of analyses of covariance, comparing experimental and control conditions while controlling for pre-test differences in attitude. No significant difference was found between experimental and control groups in their post-test attitude scores. Subgroup analyses (see Table 9b) showed that there was a significant difference between the experimental and control groups among abstainers but not among drinkers: abstainers who received the experimental program were significantly less pro-alcohol than their controls (2.04 vs 2.13; $F = 4.51$, $df = 1,641$, $p < .05$). Further analyses showed that, among males, the experimental program had opposite effects on drinkers and abstainers. Among the male drinkers the experimental group had significantly more pro-alcohol attitudes than their controls (2.43 vs 2.22; $F = 5.49$, $df = 1,235$, $p < .02$), while among male abstainers the experimental group were significantly less pro-alcohol than their controls (2.02 vs 2.17; $F = 4.44$, $df = 1,242$, $p < .05$). No significant effects were found for females.

3.32 Secondary School Results

Findings for the older students receiving the secondary school program were similar to those for the elementary students. There was no overall significant difference between the post-test attitudes of the experimental group and the control group (see Table 10a). The only significant finding for any

TABLE 9a

Elementary School Students

1. Post-test Alcohol Attitude Scores Adjusted for Pre-test Differences Between Experimental and Control Groups
2. Summary of Analyses of Covariance

Experimental Group: Mean Attitude Score	2.20
Control Group: Mean Attitude Score	2.20
F ratio	0.02
Significance	NS
Number of Students	1235
Number of Items	12

NS = Not Statistically Significant (i.e. $p > .05$)

TABLE 9b

Elementary School Students

1. Post-test Adjusted Alcohol Attitude Scores
2. Summary of Analyses of Covariance for Various Sample Subgroups

	Alcohol Use		Grade		Sex									
	Drinkers	Abstainers	7	8	Male					Female				
					All	Drinkers	Abstainers	G7	G8	All	Drinkers	Abstainers	G7	G8
Experimental Group: Mean Attitude Score	2.40	2.04	2.16	2.22	2.23	2.43	2.02	2.26	2.21	2.18	2.37	2.04	2.13	2.22
Control Group: Mean Attitude Score	2.31	2.13	2.15	2.21	2.20	2.22	2.17	2.15	2.21	2.21	2.38	2.11	2.17	2.26
F ratio	2.45	4.51	0.04	0.18	0.26	5.49	4.44	1.38	0.00	0.57	0.02	1.30	0.42	0.41
Significance	NS	<.05	NS	NS	NS	<.02	<.05	NS	NS	NS	NS	NS	NS	NS
Number of Students	525	642	419	811	508	236	242	128	378	725	288	400	291	432
Number of Items	12	12	12	12	12	12	12	12	12	12	12	12	12	12

TABLE 10a

Secondary School Students

1. Post-test Alcohol Attitude Scores Adjusted For Pre-test Differences Between Experimental and Control Groups
2. Summary of Analysis of Covariance

Experimental Group: Mean Attitude Score	2.26
Control Group: Mean Attitude Score	2.25
F ratio	0.12
Significance	NS
Number of Students	677
Number of items	12

NS = Not Statistically Significant (i.e, $p > .05$)

sample sub-group (see Table 10b) partially replicated the finding already reported for the younger students: among male drinkers the attitudes of those in the experimental group were significantly more pro-alcohol after the program than among control group members (2.50 vs 2.18; F = 7.50, df = 1,109, p < .01).

3.3 Summary

The impact of the programs on alcohol-related attitudes were of statistical significance. Among male drinkers, both the elementary and secondary programs resulted in significantly more pro-alcohol attitudes, while the elementary program had the opposite effect among abstainers. No significant attitudinal effect was found among females. It is obvious, however, that although statistically significant, the absolute size of the differences between experimental and control groups was not large (e.g., 0.21 and 0.32 for the elementary and secondary school male drinkers respectively). The practical program importance of these findings will be discussed later.

TABLE 10b

Secondary School Students

1. Post-test Adjusted Alcohol Attitude Scores
2. Summary of Analyses of Covariance for Various Sample Subgroups

	Alcohol Use		Grade		Sex									
	Drinkers	Abstainers	9	10	Male					Female				
					All	Drinkers	Abstainers	G9	G10	All	Drinkers	Abstainers	G9	G10
Experimental Group: Mean Attitude Score	2.40	2.06	2.23	2.35	2.38	2.50	2.13	2.34	2.53	2.23	2.36	2.02	2.18	2.31
Control Group: Mean Attitude Score	2.32	2.15	2.16	2.49	2.24	2.18	2.31	2.14	2.55	2.20	2.36	2.09	2.16	2.47
F ratio	1.50	1.49	1.75	2.25	2.50	7.50	1.48	3.43	0.03	0.29	0.00	0.51	0.12	2.27
Significance	NS	NS	NS	NS	NS	<.01	NS	(.06)	NS	NS	NS	NS	NS	NS
Number of Students	388	270	481	196	186	110	67	141	45	481	273	199	339	142
Number of Items	12	12	12	12	12	12	12	12	12	12	12	12	12	12

3.4 Changes in Reported Alcohol Use

As already described, several measures of reported alcohol use were obtained; these were used in conjunction with several forms of analyses to provide an assessment of program impact, including effects on quantity of alcohol consumed and change in status as a "drinker" or "abstainer".

3.41 Elementary School Results

Table 11a summarizes the results of the analyses of covariance of post-program alcohol consumption comparing experimental and control groups, controlling for pre-program differences in consumption. No significant consumption differences were found between experimental and control groups either for the three beverage types or overall consumption; nor were any significant differences found when analyzed separately for sub-groups based on sex, grade or for drinkers alone.

As expected, the distribution of volume consumed was extremely skewed, with the majority of students consuming very little and only a small minority consuming large quantities. To control for this skewness, re-analyses were undertaken to determine: (a) the frequency of change from use of alcohol in the week prior to the pre-test to non-use in the week prior to the post-test, and (b) the corresponding relative frequency of change from non-use to use of alcohol (see Table 11b for summary of these proportions). None of the comparisons between experimental and control groups for the two types of behaviour-change were significant. Separate analyses for the two grade levels and the two sexes (see Table 11c) showed that only two of the thirty-two comparisons between experimental and control groups were significant: this proportion of significant results could have occurred by chance. Among males

TABLE 11a

Elementary School Students

1. Post-test Adjusted Mean Alcohol Consumption
2. Summary of Analyses of Covariance

	Beer (Ounces)	Liquor (Ounces)	Wine (Ounces)	Total (Ounces of Absolute Alcohol)
Experimental Group: Mean Consumption	4.77	0.42	1.53	0.73
Control Group: Mean Consumption	4.37	0.25	1.69	0.88
F ratio	0.10	2.10	0.13	0.45
Significance	NS	NS	NS	NS
Number of Students	1089	1058	1054	1145

NS = Not Statistically Significant (i.e. $p > .05$)

TABLE 11b

Elementary School Students

Proportions of Changes in Alcohol Use, Pre- vs Post-test
for Experimental and Control Groups (1)

	Beer		Liquor		Wine		Total	
	n/n	%	n/n	%	n/n	%	n/n	%
<u>Change From Use to Non-Use</u>								
Experimental	36/93	38.7	30/58	51.7	61/119	51.3	84/199	42.2
Control	10/25	40.0	11/23	47.8	12/32	37.5	18/54	33.3
<u>Change From Non-Use to Use</u>								
Experimental	49/725	6.8	32/730	4.4	45/666	6.8	75/658	11.4
Control	12/246	4.9	8/247	3.2	25/239	10.5	27/234	11.5

(1) No comparisons between experimental and control group proportions were statistically significant

Elementary School Students

- | | Beer | | | Liquor | | | Wine | | | Total | | | | |
|---|--------|------|----------|--------|------|----------|--------|------|----------|-------|--------|----------|------|------|
| | n/N | % | χ^2 | n/N | % | χ^2 | n/N | % | χ^2 | n/N | % | χ^2 | Sig. | |
| <u>Change From</u>
<u>Use to Non-Use</u> | | | | | | | | | | | | | | |
| GRADE 7 | | | | | | | | | | | | | | |
| Experimentals | 7/21 | 33.3 | 0.35 | 8/18 | 44.4 | 0.18 | 16/32 | 50.0 | 0.11 | NS | 21/47 | 44.7 | 0.04 | NS |
| Controls | 3/5 | 60.0 | | 5/8 | 62.5 | | 6/15 | 40.0 | | | 10/22 | 45.5 | | |
| GRADE 8 | | | | | | | | | | | | | | |
| Experimentals | 29/70 | 41.4 | 0.07 | 22/39 | 56.4 | 0.60 | 48/86 | 52.3 | 1.04 | NS | 63/150 | 42.0 | 2.53 | NS |
| Controls | 7/20 | 35.0 | | 6/15 | 40.0 | | 6/17 | 35.3 | | | 8/32 | 25.0 | | |
| MALES | | | | | | | | | | | | | | |
| Experimentals | 18/52 | 34.6 | 0.05 | 13/21 | 61.9 | 1.00 | 28/59 | 47.5 | 1.34 | NS | 41/100 | 41.0 | 3.96 | <.05 |
| Controls | 5/15 | 33.3 | | 4/11 | 36.4 | | 4/15 | 26.7 | | | 4/24 | 16.7 | | |
| FEMALES | | | | | | | | | | | | | | |
| Experimentals | 18/40 | 45.0 | 0.01 | 17/37 | 45.9 | 0.17 | 32/59 | 54.2 | 0.06 | NS | 43/98 | 43.9 | 0.00 | NS |
| Controls | 5/10 | 50.0 | | 7/12 | 58.3 | | 8/17 | 47.1 | | | 14/30 | 46.7 | | |
| <u>Change From</u>
<u>Non-Use to Use</u> | | | | | | | | | | | | | | |
| GRADE 7 | | | | | | | | | | | | | | |
| Experimentals | 17/222 | 7.7 | 1.30 | 10/218 | 4.6 | 0.85 | 15/205 | 7.3 | 0.01 | NS | 22/208 | 10.6 | 0.29 | NS |
| Controls | 4/108 | 3.7 | | 2/108 | 1.9 | | 7/102 | | | | 8/101 | 7.9 | | |
| GRADE 8 | | | | | | | | | | | | | | |
| Experimentals | 32/500 | 6.4 | 0.00 | 21/508 | 4.1 | 0.02 | 29/457 | 6.3 | 5.78 | <.02 | 53/447 | 11.9 | 0.36 | NS |
| Controls | 8/138 | 5.8 | | 6/139 | 4.3 | | 18/137 | 13.1 | | | 19/133 | 14.3 | | |
| MALES | | | | | | | | | | | | | | |
| Experimentals | 16/288 | 5.6 | 0.02 | 14/401 | 4.7 | 0.09 | 16/258 | 6.2 | 3.55 | (.06) | 20/248 | 8.1 | 1.83 | NS |
| Controls | 6/90 | 6.7 | | 3/93 | 3.2 | | 12/91 | 13.2 | | | 12/87 | 13.8 | | |
| FEMALES | | | | | | | | | | | | | | |
| Experimentals | 33/436 | 7.6 | 2.02 | 17/427 | 4.0 | 0.03 | 29/407 | 7.1 | 0.22 | NS | 55/409 | 13.4 | 0.76 | NS |
| Controls | 6/156 | 3.8 | | 5/154 | 3.2 | | 13/148 | 8.8 | | | 15/147 | 10.2 | | |

who reported having drunk during the week prior to the pre-test, a larger proportion in the experimental group than in the control group (41.0% vs 16.7%) reported not having used alcohol in the week prior to the post-test. Of those grade 8 students who reported not having drunk in the week prior to the pre-test, a larger proportion of the control group than of the experimental group (13.1% vs 6.3%) reported drinking in the week prior to the post-test.

A similar form of analysis was conducted to examine the relationships between typical alcohol consumption (discriminating between "abstainers" and "drinkers"), and impact on the post-test week's consumption. It was found that among typical abstainers 95.6% (433/453) of those receiving the program reported not drinking during the week prior to the post-test compared to 91.0% (151/166) of the corresponding abstainer controls ($Z = 2.21$, $p < .05$). There was no similar significant program effect on the behaviour of "drinking" students: 55.8% (213/382) of the experimental students versus 59.6% (68/114) of their controls reported not drinking in the week prior to the post-test.

3.42 Secondary School Results

As with the elementary school's program, the secondary school's program showed no significant effect among those in the experimental group compared to the control group (see Table 12a for summary). Similarly there were no differences between experimental and control groups in the proportions who changed from alcohol use to non-use or vice versa at the time of the post-test (see Table 12b). Five of the 32 individual comparisons between experimental and control groups for the grade and sex subgroups were significant (see Table 12c). The only significant change from alcohol use to non-use occurred among males, but the low number of cases involved reduces the reliability of this finding. Larger proportions of students in the control group changed from non-use to use among

TABLE 12a

Secondary School Students

1. Post-test Adjusted Mean Alcohol Consumption
2. Summary of Analyses of Covariance

	Beer (Ounces)	Liquor (Ounces)	Wine (Ounces)	Total (Ounces of Absolute Alcohol)
Experimental Group: Mean Consumption	7.20	0.91	2.31	1.70
Control Group: Mean Consumption	8.00	0.44	2.00	0.73
F ratio	0.12	1.63	0.25	0.53
Significance	NS	NS	NS	NS
Number of Students	616	587	599	648

NS = Not Statistically Significant (i.e. $p > .05$)

TABLE 12b

Secondary School Students

Proportions of Changes in Alcohol Use, Pre- vs Post-test
for Experimental and Control Groups (1)

	Beer		Liquor		Wine		Total	
	n/n	%	n/n	%	n/n	%	n/n	%
<u>Change From Use to Non-Use</u>								
Experimental	35/90	38.9	36/81	44.4	50/124	40.3	72/214	33.6
Control	10/16	62.5	5/8	62.5	8/12	66.7	12.26	46.2
<u>Change From Non-Use to Use</u>								
Experimental	34/439	7.7	39/418	9.3	39/393	9.9	53/338	15.7
Control	8/75	10.7	4/81	4.9	12/71	16.9	16/70	22.9

(1) No comparisons between experimental and control group proportions were statistically significant

Secondary School Students

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	Beer			Liquor			Wine			Total					
	n/N	%	χ^2	n/N	%	χ^2	n/N	%	χ^2	n/N	%	χ^2			
Change From Use to Non-Use															
GRADE 9															
Experimentals	19/53	35.8	1.89	18/44	40.9	0.12	NS	31/83	37.3	2.70	NS	43/129	33.3	0.59	NS
Controls	8/13	61.5		3/5	60.0			7/10	70.0			9/20	45.0		
GRADE 10															
Experimentals	16/37	43.2	0.03	18/37	48.6	0.00	NS	19/41	46.3	0.39	NS	29/85	34.1	0.12	NS
Controls	2/3	66.7		1/3	66.7			1/2	40.0			3.6	50.0		
MALES															
Experimentals	10/37	27.0	3.43	10/20	50.0	-	-	5/25	20.0	4.94	<.05	14/62	22.6	2.31	NS
Controls	4/5	80.0		0/1	0.0			3/3	100.			4/7	57.1		
FEMALES															
Experimentals	22/48	45.8	0.04	25/58	43.1	1.04	NS	44/95	46.3	0.03	NS	57/147	38.8	0.00	NS
Controls	6/11	54.5		5/7	71.4			5/9	55.6			8/19	42.1		
Change From Use to Non-Use															
GRADE 9															
Experimentals	17/314	5.4	0.62	15/303	5.0	0.05	NS	22/281	7.8	7.30	<.01	27/257	10.5	5.40	<.02
Controls	5/34	9.3		4/60	6.7			11/52	21.2			12/51	23.5		
GRADE 10															
Experimentals	17/125	13.6	0.07	24/115	20.9	3.98	<.05	17/112	15.2	0.64	NS	26/81	32.1	0.45	NS
Controls	3/21	14.3		0/21	0.0			1/9	5.3			4/19	21.1		
MALES															
Experimentals	10/104	9.6	5.05	14/110	12.7	0.04	NS	14/113	12.4	0.43	NS	17/87	19.5	1.17	NS
Controls	6/19	31.6		2/23	8.7			4/19	21.1			7/19	36.8		
FEMALES															
Experimentals	22/329	6.7	0.35	25/303	8.3	1.00	NS	25/274	9.1	1.26	NS	34/245	13.9	0.23	NS
Controls	2/56	3.6		2/58	3.4			8/52	15.4			9/51	17.6		

grade 9 students (wine drinking 21.2% vs 7.8%, and total consumption 23.5% vs 1.5%), and males (beer drinking 31.6% vs 9.6%). An anomalous finding showed that experimental students in grade 10 changed more from non-use to use than did their controls (20.9% vs 0.0%).

In contrast to the elementary school results, where the program appeared to reinforce the behaviour of abstainers, the secondary schools' program produced the complementary effect among drinkers. Fewer of experimental "drinking" students (140/314) compared to control "drinking" students (36/58) reported drinking during the week prior to the post-test (44.6% vs 62.1%: $Z = 2.45$, $p < .02$). The corresponding non-significant difference for abstainers was 93.0% (211/227) versus 83.3% (30/36).

3.43 Summary

Few significant behavioural effects of the experimental programs were found. Results indicating significant differences in change from alcohol use to non-use were too few, compared to the number of statistical tests conducted, to be given much weight - most of these results did, however, indicate a positive effect of the programs. There was evidence that the elementary schools' program reinforced the behaviour of abstainers, at least during the week prior to the post-test, while the secondary schools' program had a comparable beneficial effect of reducing the tendency of drinkers to use alcohol prior to the post-test.

3.5 Changes in Reported Expectations Concerning Future Alcohol Use

As described earlier, students indicated on both pre- and post-tests their anticipated drinking patterns during the succeeding twelve months.

Responses were coded so that at one extreme a "1" indicated an anticipated large increase in consumption, while "3" showed no expected change, and at the other extreme "5" signified an expected large reduction in consumption.

3.51 Elementary School Results

No significant effect of the elementary schools' program was evident on this measure of expected future alcohol use, either for the overall sample or any subgroup (see Table 13). The means for the experimental and control groups were 3.00 and 2.96 respectively.

3.52 Secondary School Results

In contrast to the elementary program, the secondary program produced a significant overall difference in expectations regarding future alcohol use expressed by the experimental and control groups (3.01 vs 2.88 respectively, $F = 3.92$, $df = 1,611$, $p < .05$), indicating that those receiving the program were more likely to expect to use alcohol less in the following twelve months. This effect held up for the following sub-groups: male drinkers (3.05 vs 2.43 for experimental and controls respectively, $F = 6.37$, $df = 1,96$, $p < .02$), female non-drinkers (3.03 vs 2.89; $F = 6.37$, $df = 1,180$, $p < .02$), and for grade ten students (3.03 vs 2.73; $F = 6.70$, $df = 1,178$, $p < .01$) (see Table 14).

3.53 Summary

The potential behavioural impact of the experimental program was in evidence only at the secondary level where, in contrast to the attitudinal outcomes, it appeared to have a positive effect on male drinkers and female abstainers.

TABLE 13

Elementary School Students

1. Post-test Adjusted Alcohol Use Expectation Scores
2. Summary of Analyses of Covariance for Various Sample Subgroups

	Alcohol Use	Grade		Sex											
		7	8	Male						Female					
				All	Drinkers	Abstainers	G7	G8	All	Drinkers	Abstainers	G7	G8		
Experimental Group: Mean Expectation Score	All Students	Drinkers	Abstainers	7	8	All	Drinkers	Abstainers	G7	G8	All	Drinkers	Abstainers	G7	G8
Experimental Group: Mean Expectation Score	3.00	2.99	2.99	3.02	2.99	2.96	2.89	3.01	2.83	2.99	3.03	3.08	2.98	3.10	2.98
Control Group: Mean Expectation Score	2.96	2.90	2.99	3.00	2.90	2.85	2.75	2.91	2.87	2.85	3.03	2.99	3.04	3.12	2.93
F ratio	0.51	0.77	0.01	0.22	2.14	1.77	0.73	2.41	0.05	2.34	0.00	0.45	1.82	0.06	0.40
Significance	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Number of Students	1025	471	528	336	686	418	207	200	106	310	606	263	328	230	374

TABLE 14

Secondary School Students

1. Post-test Adjusted Alcohol Use Expectation Scores
2. Summary of Analyses of Covariance for Various Sample Subgroups

		Alcohol Use		Grade		Sex									
		Drinkers	Abstainers	9	10	Male					Female				
						All	Drinkers	Abstainers	G9	G10	All	Drinkers	Abstainers		
Experimental Group: Mean Expectation Score	3.01	2.99	3.03	3.00	3.03	3.06	3.05	3.03	2.97	3.18	2.99	2.97	3.03	3.01	2.95
Control Group: Mean Expectation Score	2.88	2.81	2.96	2.94	2.73	2.80	2.43	3.11	2.97	2.56	2.91	2.92	2.89	2.94	2.81
F ratio	3.92	3.20	0.98	0.60	6.70	2.42	6.37	0.21	0.00	5.07	1.56	0.20	6.37	0.59	1.49
Significance	<.05	NS	NS	NS	<.01	NS	<.02	NS	NS	<.05	NS	NS	<.02	NS	NS
Number of Students	612	364	238	434	178	155	97	53	115	40	449	263	181	319	130

3.6 Student Evaluations of Lessons and Programs

Evaluations of individual lessons were obtained from samples of students immediately after exposure to the lesson. Unfortunately, relatively few evaluations were obtained from either the elementary or secondary school students.

The overall program evaluations, administered at the end of the course, were more satisfactorily completed by the secondary school students, but were used in only one of the elementary schools.

3.61 Elementary School Results

Table 15a summarizes the evaluations made of each of the lessons in the elementary school program and the averages for all lessons taken together. Several conclusions can be drawn from this table, and from a comparison between all nine lessons for each rating dimension - Tukey's Honestly Significant Difference procedures were employed for these analyses (Winer 1971).

1. The averages for all five ratings dealing with lesson evaluation were above the mid point (3.5) of the 7-point scales, indicating a generally positive response to the program.
2. The highest ratings were with respect to ease of understanding the lessons (mean = 5.89) and perceived correctness of the information contained in the lessons (mean = 5.56). Interest, usefulness and topic importance received mean ratings of 4.82, 4.23 and 3.94 respectively.
3. The three rating scales dealing with lesson impact were generally lower than those reported above. Students felt they learned more about other people (mean = 4.61) than about themselves (mean = 3.15). Little impact on their own behaviour was anticipated (mean = 2.78).

TABLE 15a

Elementary School Students

Mean Ratings of Individual Lessons (1)

Evaluation Variables	Lessons									Overall Average
	1	2	3	4	5	6	7	8	9	
	Myths	Television Adverts	Reasons For Drinking	Effects Of Drinking	Positive Uses	Driving	Teenagers	Family	Sports	
Interest	4.17	3.43	6.00	5.05	5.13	4.33	4.77	5.22	2.92	4.82
Usefulness	3.44	3.36	4.62	5.20	4.73	4.13	4.00	3.98	2.25	4.23
Ease of Understanding	6.22	6.29	6.29	6.00	5.54	5.69	5.41	6.27	6.18	5.89
Information Correct	5.44	6.21	5.14	5.68	6.12	5.47	5.06	4.93	5.42	5.56
Topic Importance	3.78	3.00	4.25	5.25	4.22	3.74	2.88	4.02	2.67	3.94
Learning About Self	2.50	2.07	3.55	4.10	3.22	3.18	2.94	3.15	2.50	3.15
Will Change Own Behaviour	2.61	2.14	2.45	3.45	2.99	2.84	2.69	2.90	1.75	2.78
Learning About Others	5.06	3.50	6.10	5.05	4.27	4.87	5.25	4.15	2.83	4.61
Overall Average	4.15	3.75	4.86	4.99	4.53	4.30	4.08	4.29	3.40	4.38
Sample Size	18	14	29	19	74	45	16	40	12	272

(1) Scores range from 1-7, with 1 representing a very negative and 7 a very positive evaluation.

4. Obviously, not all lessons were equally well received by students. The most positively rated lessons were Lessons No. 4 (mean = 4.99), No. 3 (mean = 4.86) and No. 5 (mean = 4.53) dealing respectively, with the effects of drinking, reasons for drinking and the positive uses of alcohol. The poorest rating was received by Lesson No. 9 (mean = 3.40) which dealt with alcohol and sports.

5. a. The lessons did not differ from one another in terms of ease of understanding, perceived correctness of information and anticipated behavioural impact.

b. Two subsets of lessons were found with respect to: perceived usefulness (Lesson No. 9 was rated as significantly less useful than Nos. 3, 4, 5 or 6); topic importance (Lesson No. 4 was rated significantly higher than Nos. 2, 6, 7 and 9); and learning about self (Lesson No. 4 was rated significantly higher than No. 2).

c. Three subsets were found with respect to: learning about others (Lesson No. 3 was rated significantly higher than Nos. 2, 5, 8 and 9; Lesson No. 9 was rated significantly lower than Nos. 1, 3, 4, 6 and 7); and average evaluation (Lessons Nos. 3 and 4 were rated more highly than Nos. 2 and 9; Lesson No. 9 was rated lower than Nos. 3, 4 and 5).

d. In terms of interest, four subsets emerged: Lesson No. 3 was rated higher than Nos. 1, 2, 6 and 9; and Lesson No. 9 was rated lower than Nos. 3, 4, 5, 7 and 8.

Of the 272 elementary school lesson evaluations, 176 indicated what they found most helpful and 133 indicated what was least helpful. 112 mentioned the format of the lessons as their most positive characteristic, while the most

frequently mentioned (by 50 respondents) unfavourable aspect was that the knowledge contained in the lessons was not useful.

Only one school (144 students) completed the formal program evaluations. 127 (88%) of these students were able to mention something they had learned from the course, and 67% identified in what way they felt they were better able to cope as a result of the course. 80% felt their time had been profitably spent by taking the course, giving it a mean rating of 4.6 (with a standard deviation of 1.45) on a seven-point scale when asked to compare the course to other classes - only 16% rated the program at 3 or less on the scale. 84% of the students were of the opinion that the course covered topics not found in their other school courses.

3.62 Secondary School Results

The lesson evaluations provided by the secondary school students are summarized in Table 15b. The conclusions to be drawn from analyses of these results are:

1. The lessons were evaluated highly as measured by the five rating scales dealing with lesson assessment; on each of these five scales the average rating was well above the scale's midpoint.
2. The highest rating was again on the dimension of ease of understanding, which was rated near the maximum of 7 (mean = 6.29), and the perceived correctness of the information (mean 5.48). The average ratings for interest, usefulness and topic importance were 4.73, 4.14 and 4.19 respectively.
3. The ratings of the lessons in terms of potential impact closely paralleled those found for the elementary school lessons. Average ratings were lower than those dealing with the lessons' characteristics. Students felt they

TABLE 15b

Secondary School Students

Mean Ratings of Individual Lessons (1)

Evaluation Variables	Lessons									Overall Average
	1	2	3	4	5	6	7	8	9	
	Myths	Television Programs	Needs	Youth	The Law	Driving	Driving	Family	Fitness	
Interest	4.28	5.31	4.85	4.96	5.50	5.22	4.33	4.41	4.17	4.73
Usefulness	3.77	4.60	4.22	3.39	5.50	3.87	5.14	3.70	4.65	4.14
Ease of Understanding	6.15	6.33	6.17	6.71	6.60	5.74	6.17	6.46	6.52	6.29
Information Correct	5.16	5.36	5.93	5.33	6.40	5.30	6.17	5.27	5.87	5.48
Topic Importance	3.52	4.44	4.68	3.83	4.70	4.57	5.43	4.14	4.44	4.19
Learning About Self	2.25	3.76	4.05	2.92	2.50	3.57	4.00	2.47	3.09	3.03
Will Change Own Behaviour	2.33	2.51	3.54	2.08	2.17	2.22	3.00	2.16	3.00	2.52
Learning About Others	4.15	5.42	5.46	4.79	4.80	4.83	4.86	5.07	4.44	4.83
Overall Average	3.88	4.72	4.87	4.24	4.74	4.53	4.72	4.20	4.52	4.38
Sample Size	85	55	41	24	20	23	7	43	23	323

(1) Scores range from 1-7, with 1 representing a very negative and 7 a very positive evaluation.

learned more about other people's behaviour (mean 4.83) than about themselves (mean = 3.03); once again anticipated impact on students' own behaviour was slight (mean = 2.52).

4. The most positively rated lessons were Lessons No. 3 (mean = 4.87), No. 5 (mean = 4.74) and No. 2 (mean = 4.72). These lessons dealt respectively with people's needs, the law and alcohol use and alcohol and television programming. The lowest rating was received by Lesson No. 1 (mean 3.88) dealing with myths concerning alcohol.

5. a. The lessons did not differ significantly from one another with respect to interest, ease of understanding or importance of topics covered by the lessons.

b. Two subsets of lessons were identified with regard to: perceived usefulness (Lesson No. 5 was rated significantly more positively than Lesson Nos. 1, 4 and 8); correctness of information (Lesson No. 5 was rated more highly than No. 1); learning about self (Lesson No. 3 was rated more highly than Lessons Nos. 1, 5 and 8); learning about others (Lessons Nos. 2 and 3 were rated more positively than No. 1); and anticipated impact on own behaviour (Lesson No. 3 was rated higher than No. 4 and No. 8).

c. Three subsets of lessons emerged with respect to overall average evaluation (Lesson No. 3 was rated above Lessons No. 1 and No. 8; Lessons No. 5 was ranked above No. 1).

As with the elementary student evaluations, the most positive comments were made with respect to the lessons' format; this was mentioned in 104 of the 203 lesson evaluations received as being the most helpful aspect of the lessons. The most frequently cited "least helpful" feature was, again, that

the knowledge conveyed in the lessons was not useful - mentioned in 21 of the evaluations.

502 secondary school students completed the final evaluation of the entire program. 408 (81%) identified something they had learned from the course, and 328 (65%) identified some aspect of their life which they felt better able to handle as a result of the course. 71% felt that the time invested in classes had been worthwhile in terms of what they had derived from the course. In response to the question "How would you rate these ten classes compared to other classes?" the overall average of 4.6 (with a standard deviation of 1.62) on a seven-point scale indicated above average satisfaction - only 19.7% rated the class at a value of 3 or less. Finally 77% (83% of those answering this question) felt that the course covered topics not covered elsewhere in the school curriculum.

3.63 Summary

The content and the format of the lessons in both the elementary and secondary school programs were well received by the participating students. In both cases, all lessons were easy to understand and their contents were seen to be credible. Students at both levels, however, appeared to feel they learned more about other people than about themselves, and did not expect the courses to have much impact on their own behaviour.

Elementary students were most positive about the lessons dealing with the effects of and reasons for alcohol use, as well as the lesson concerned with some of the positive uses of alcohol. The secondary school students most appreciated the topics of people's needs, the law and alcohol use and alcohol and television programming.

The overwhelming majority of those who completed lesson and program evaluations felt that the programs had been worthwhile, that they were above average compared to other courses, that they had learned new material and that the programs helped them in their ability to cope with life.

4. DISCUSSION OF RESULTS

Table 16 summarizes the major findings of the study. These will be discussed in relation to the three major hypotheses.

Hypothesis I : Students in the experimental groups would be more likely than control groups to possess more knowledge about alcohol after exposure to the program.

The results from the evaluations of both elementary and secondary school programs provided unambiguous support for Hypothesis I: the programs were successful in raising levels of knowledge among those exposed to the programs significantly more than the increase shown by the control group.

Support for Hypothesis I was found among all sub-groups, that is, among "drinkers" and "abstainers", grades 7, 8, 9 and 10, and among both males and females. It was necessary, however, to correct for the relative lack of lesson exposure of secondary school males for Hypothesis I to be supported among the older male sub-group.

Hypothesis II : Students in the experimental groups would be more likely than control groups to exhibit attitudes less favourable to alcohol use after exposure to the program.

This hypothesis received no support from the female students' results: there were no significant differences between female experimental and control groups as a result of the programs.

Among males, the hypothesis received support only from elementary school non-drinkers (i.e. those who claimed they usually did not drink at all). Among male drinkers the programs appeared to have the unpredicted and less

TABLE 16

Summary of Findings of Experimental Evaluation of
Experimental Alcohol Curriculum Lesson Plans: Results
Of Comparisons Between Experimental and Control Groups

Dependent Measures	Schools	
	Elementary	Secondary
Knowledge About Alcohol	<u>All Students:</u> Experimental group increased knowledge more than control group	<u>All Students:</u> Experimental group increased knowledge more than control group
Attitudes Regarding Alcohol	<u>Females:</u> No effect <u>Males: Drinkers'</u> attitudes became more pro-alcohol; <u>Non-Drinkers</u> became less pro-alcohol	<u>Females:</u> No effect <u>Males: Drinkers'</u> attitudes became more pro-alcohol
Reported Alcohol Use in Preceding Week	<u>Non-Drinkers:</u> More of the experimental group did not drink in the week prior to the post-test	<u>Drinkers:</u> More of the experimental group did not drink in the week prior to the post-test
Expectations Regarding Future Alcohol Use	No effect	<u>Females: Non-Drinkers</u> expected to use alcohol less in the next twelve months <u>Males: Drinkers</u> expected to use alcohol less in the next twelve months

desirable effect of producing more pro-alcohol attitudes among experimental groups than among control groups.

Several possible explanations exist to explain the lack of complete support for this hypothesis.

(i) Explanation No. 1: The small but statistically significant results could be attributed to the unreliability of the attitude measures.

BUT: (i) the attitude measures were not very unreliable (see earlier details); (ii) unreliability of measures would be less likely rather than more likely to produce significant results; (iii) the similarity of the findings in the two school samples greatly increases the reliability of the findings. The results from the two samples, provide an independent replication of the study: similar findings were produced when two different programs were administered to two different samples. It is not reasonable, therefore, to dismiss the results as due to the influence of unreliability and chance.

(ii) Explanation No. 2: The failure to find significant differences among females might have resulted from a ceiling effect if females had possessed significantly more extreme attitudes prior to the program.

BUT: there were, in fact, no significant differences between males and females prior to the program with respect to attitudes. The average attitude scores were 2.44 (experimental males), 2.36 (experimental females), 2.37 (control males) and 2.39 (control females).

(iii) Explanation No. 3: Differences in the quality of teaching by male versus female teachers may have accounted for the differential sex effects, since, especially at the secondary school level, students were taught by similar sex teachers.

BUT: this would not explain the differential effects for male "drinkers" and "abstainers".

(iv) Explanation No. 4: Salience of the alcohol issues may be greater for males than for females, especially as these relate to their own alcohol use. For this reason males would be more affected by the program than females, and drinkers and non-drinkers would be influenced differently. No data is available to support or reject this explanation.

Of special concern is the finding that among secondary school male drinkers, attitudes became significantly more pro-alcohol after the program. The full implications of this finding are not, at this time, clear. It may be that this change in attitudes resulted from a realization that alcohol does not, itself, necessarily create problems. This view places more responsibility on the individual than on the substance and would not find a more pro-alcohol attitude intrinsically objectionable. This interpretation, however, would apply only to the drinkers and not to the "abstainers" whose attitudes became less pro-alcohol.

Several further issues regarding the attitude changes require comment. Firstly, the demonstration of mixed results within the same study is not unique. A review of the drug education research literature shows a wide range of results: some studies produce no attitude effects at all, some show positive effects, some negative effects, and, as in the present study, some studies show positive results for only some subgroups (see Goodstadt 1976). This is, however, the first instance in which differential effects have been reported (or examined?) for drug users versus non-users.

A second consideration concerns the program implications of the present findings. A distinction is always required between statistical and

practical significance. An educational program may produce statistically significant effects, but widespread implementation of the program may not be warranted by the small absolute size of program effects. In the present case, the absolute size of the significant attitude of change was of the order of +0.23 on a five point attitude scale, representing a 6% shift in attitudes. The practical significance of these shifts is difficult to determine at this time, although it could be argued that the practical implications are heightened by the difficulty of demonstrating any significant attitude change as a result of drug education programs.

A third and very important issue concerns the relationship between the reported attitude change and behavioural outcomes. An apparent conflict exists between the pro-alcohol attitudes among secondary school male "drinkers" resulting from the program and the reported reduction in "drinkers'" consumption prior to the post-test. More detailed examination of the results revealed that there was a significant positive (Pearson product-moment) correlation between attitude measures and reported alcohol use -- +0.42 ($p < .001$) for the pre-test measures and +0.34 ($p < .001$) for the post-test attitude and alcohol use measures. There was, however, only a very small relationship between attitude change and behaviour change ($r = +0.07$ and +0.06 for the elementary and secondary schools respectively). These findings are in agreement with earlier research which has shown only poor relationships between attitudes and behaviour and even worse relationships between attitude change and behaviour change (Goodstadt, 1976).

A similar conflict involves the increase in pro-alcohol attitudes among secondary school male drinkers and this same group's expectation to use alcohol less in the future. Examination of the relationships between

attitudes and expectations showed little relationship between the two measures on the pre-test (correlation coefficient = +0.10) and only a small correlation on the post-test ($r = +0.14$). The two measures may measure different phenomena. Previous research has shown that attitudes are most strongly related to specific behaviours proximate in time and definition to the object of the attitudes. It is, therefore, not surprising that the attitude and expectation measures were not strongly correlated, since the expectation measure concerned alcohol use extended over the following twelve months. Analyses also showed that expectations concerning future use were not at all related to consumption at either the time of the pre-test ($r = -0.20$) or the post-test ($r = +0.09$). Furthermore, changes in expectations regarding future use were not related to changes in either attitudes ($r = -0.03$) or changes in reported consumption at the time of the post-test ($r = +0.02$). The conclusion, therefore, seems to be that the experimental programs were able to influence attitudes, current alcohol use and expectations concerning future use. Which of these three variables, however, is most strongly associated with actual future behaviour is not clear from the present study. Further research into the relationships between changes in attitudes, alcohol use, expectations and their impact on future behaviour is required.

The results, therefore, indicate that although a significant pro-alcohol shift occurred among secondary school male drinkers, this result (a) need not necessarily indicate an unhealthy or undesirable attitude, (b) need not necessarily lead to more alcohol abuse (or even use) in the future, and (c) most significantly, was found in conjunction with less reported alcohol among drinkers and less expected future alcohol use among the same group of male drinkers. A cautious decision regarding program

implementation, given the state of current programs and research, would, therefore, advocate program implementation with the recommendation that further research be conducted to examine the long term attitudinal and behavioural impact of the program.

Hypothesis IIIa : Students in the experimental groups would be more likely than control groups to show a reduction in their reported alcohol consumption after exposure to the program.

This hypothesis was supported among elementary school "non-drinkers" and among secondary school "drinkers". Experimental groups in these two sub-groups were more likely to report drinking nothing in the week prior to the post-test. No significant differences were found for "drinkers" at the elementary level or "non-drinkers" in the secondary schools. Nor was there a sufficient number of consistent differences in the measures of volume of alcohol consumed to support the hypothesis.

(i) Explanation No. 1: The apparently positive effects of the program on reported alcohol consumption may have been due to the "demands" placed on the students by the experimental situation. An obviously "desirable" response on the post-test would be to report low or no alcohol consumption. Students may, therefore, have responded to the "demands" of the situation to provide the expected or most desirable response, and hence appeared to lower their consumption in the week prior to the post-test. There is no test of this explanation available in the present study.

(ii) Explanation No. 2: Since the week prior to the post-test often included part of the time devoted to the program, the positive results of the programs may have been a temporary effect due to the high salience of alcohol issues in that period of time. More permanent effects would require long-term follow-ups.

Hypothesis IIIb : Students in the experimental groups would be more likely than control groups to expect to use alcohol less in the succeeding twelve months after exposure to the program.

This hypothesis received no support from the elementary students: there were no significant differences between elementary school experimental and control students in their anticipated use of alcohol in the following twelve months.

Amongst the secondary school students, there was support for the hypothesis from female non-drinkers and male drinkers: among both of these sub-groups the experimental students expected to reduce their consumption more than did the control groups. The program appears, therefore, merely to have reinforced the position of female non-drinkers, encouraging them to continue as non-drinkers. More striking was the result for male drinkers, since the positive effect among this group would suggest considerable potential value for this program.

(i) Explanation No. 1: The positive results of the exposure to the program as measured by expectations concerning future use may have been due to the "demand" features of the situation already discussed in relation to reported alcohol use. No test of this explanation is possible.

Future research is required to examine the significance of the differential program effects on "drinkers" and "non-drinkers". The possibility of designing programs especially suited to "drinkers" requires close scrutiny. Not only would the presentation of programs to this group in isolation raise serious logistical problems (e.g. timetable scheduling), but serious methodological and ethical problems are created by attempting to identify sub-groups and providing alternative programs. One of the most

serious problems arises from the danger of creating a self-fulfilling prophecy by labelling "drinkers" (or any other drug-users) as different.

Future evaluations should also attempt to incorporate variables related to the social and environmental factors associated with alcohol use and abuse. Long-term evaluations of program impact (e.g. of 1 or 2 years) is also required.

The programs developed and evaluated in this study might be more closely and profitably integrated into the overall structure of health and physical education to maximize the perceived validity of the program, reduce unnecessary redundancy and maximize reinforcement and learning of concepts and behaviour change.

Finally, the average yearly amount of time currently available for alcohol education (3-5 hours) puts serious limitations on the impact of any program, no matter how exemplary it might be. Consideration of increasing time devoted to health education in general and drug/alcohol education in particular would appear warranted by the current costs to society from their misuse and abuse.

5. CHANGES IN LESSON PLANS

As a result of the evaluations provided by students and teachers, the lesson plans for both programs were revised.

Lessons that were well received were generally not altered except for the updating of old information (e.g. updating the information about the Liquor Control Act).

The lessons were initially designed to provide the necessary process and factual information, thus reducing the time spent by the teacher in researching factual material and designing lesson plans. It was recognized, however, that teachers as individuals value their own creativity and individuality in teaching. Areas in which such individuality could assert itself were, therefore, provided. In almost every instance, however, teachers applauded the amount of detail provided and urged the inclusion of even more.

The changes made in lesson plans, therefore, mainly reflect an attempt to be more explanatory and even more helpful. As an example, it was initially suggested in the secondary schools' Lesson No. 4 that newspaper items dealing with teenage drinking be used during the lesson. The rewritten program, however, includes a number of these clippings, thus saving teachers the problems of having to locate them.

Other changes in lesson plans include:

1. The inclusion of additional factual information in several lessons as requested by individual teachers.
2. The addition of better developed objectives and rationales for some lessons (e.g. secondary program Lesson No. 2).

3. A different perspective has been taken in the presentation of some lessons. For example, the original elementary program Lesson No. 6 examined students' use of alcohol in relation to the operation of a vehicle (e.g. bicycles, snowmobiles, boats). This did not, however, appear to relate to their own situations. The perspective has, therefore, become more personal, dealing, for example with driving with someone who has been drinking, an experience found to be more pertinent to students.

A view consistently expressed by students suggested that they learned relatively little about themselves and did not expect the lessons to change their behaviour. Wherever possible, therefore, personal references and opportunities to examine their own behaviour was added to render the lessons more personally salient.

Films initially played a minor but important role in several lessons (e.g. Lesson 8 of the secondary schools' program). Films are, however, often difficult to obtain when needed. Therefore, although it is still suggested that films can be effective in communicating information and stimulating discussion, they are now not essential to conducting the lessons. Written stories have now been included that can substitute for the films.

Diagrams and charts have been added so that teachers can make transparencies or dittos to enhance the lessons.

6. SUMMARY

Two sets of ten experimental alcohol education lesson plans were developed for use with students in grades 7 and 8 and grades 9 and 10. Development of the lessons progressed through a series of informal evaluations, followed by a formal test of their impact on students' alcohol-related knowledge, attitudes and use. An assessment of lesson acceptability to students and teachers was also attempted.

Lesson plans were designed to be very complete and covered a range of topics. Many teachers, due to limitations of time and interest, did not present all ten lessons to their students.

The evaluation research methodology employed comparisons of post-program measures (obtained immediately on completion of the programs and corrected for pre-program differences) of knowledge, attitudes and alcohol use obtained from both experimental classes (i.e. exposed to the lessons) and control classes. Control classes received no alcohol education during the experimental period of approximately two weeks.

A total of 952 and 582 from grades 7/8 and 9/10 respectively participated in the experimental classes. A further 316 grade 7/8 and 100 grade 9/10 students acted as controls. Eight elementary schools and eight secondary schools, participated in the study.

The results of the program evaluations showed that:

1. The lessons were well received by both students and teachers;
2. The programs at both the elementary and secondary levels increased the level of knowledge of those exposed to the programs;

3. a. The programs had no effect on the attitudes of female students.
b. Among male students who typically did not drink at all, the elementary school's program resulted in attitudes less favourable toward alcohol and its use;
c. Among male students who did drink, both programs produced attitudes more favourable towards alcohol;
4. a. The elementary schools program was associated with less reported alcohol use among typical "non-drinkers" at the time of the post-test;
b. The secondary schools' program was associated with less reported alcohol use among "drinkers" at the time of the post-test;
5. a. The elementary schools' program had no effect on expectations concerning future use of alcohol;
b. The secondary schools' program was associated with an expectation that alcohol would be used less in the succeeding twelve months; this was found for both male "drinkers" and females who usually did not drink;
6. The lesson plans were modified in line with the evaluations and feedback received from students and teachers.

The overall outcomes of the two programs appear to be positive and justify their wider use in schools. Several important questions remain, however, regarding their impact: these questions relate especially to the long-term impact of the programs and the part played by knowledge, attitudes, and behaviour in producing the desired outcomes. Implementation of the program should be accompanied by further research to determine the nature of these relationships.

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APPENDICES

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